

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children



Iowa Department of Public Health
Environmental Health Services - Lead Program

Environmental Health Services - Lead Program



Rossany Brugger
Rossany.brugger@idph.iowa.gov
(515) 281-3225



Kevin Officer
Kevin.officer@idph.iowa.gov
(515) 242-5902

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Thanks to IDPH's data and epidemiology team!

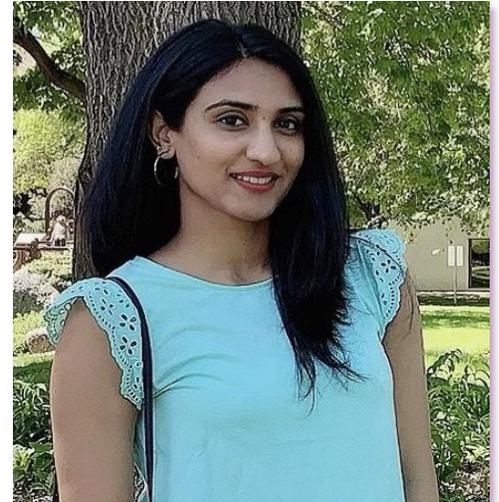
SWATHI



JOHN



Vidya



AMANDA



SWAPNA

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Main objectives

1. Describe the status of the childhood lead poisoning at national and state level.
2. Explain the purpose and process of the Mandatory Blood Lead Testing Law.
3. Identify the Iowa counties and school districts with the highest percentage of kindergartners without a blood lead test from 2016 to 2020.
4. Identify potential causes for a missing blood lead test in the most predominant regions in Iowa.

Main objectives

5. Identify the health equity variables that are not currently included in the school lead data matching process.
6. Compare the percentage of kindergartners from 2016 to 2020 who received a blood lead test after notification to parents.
7. Explain IDPH's plans to reduce the gap of kindergartners not tested for lead and the delivery of services based on health equity variables.
8. Identify and discuss options to collaborate with stakeholders and families to increase lead testing.

Session Content

- Overview of childhood lead poisoning
- Social variables that influence lead poisoning in children
- Lead Risk Model
- Mandatory blood lead testing law
- School-lead data matching process
- Study on Iowa counties and school districts with the highest percentage of children with no evidence of a blood lead test
- IDPH's work plan to reduce the gap of children under 6 no tested, based on health equity variables.

Keep in mind!

- Childhood lead poisoning is considered the most preventable environmental disease of young children.
- No safe blood lead level in children has been identified.



Facts on Childhood Lead Poisoning



Approximately half a million U.S. children ages 1-5 have blood lead levels above the blood lead value at which CDC recommends public health actions be initiated (CDC)

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Facts on Childhood Lead Poisoning

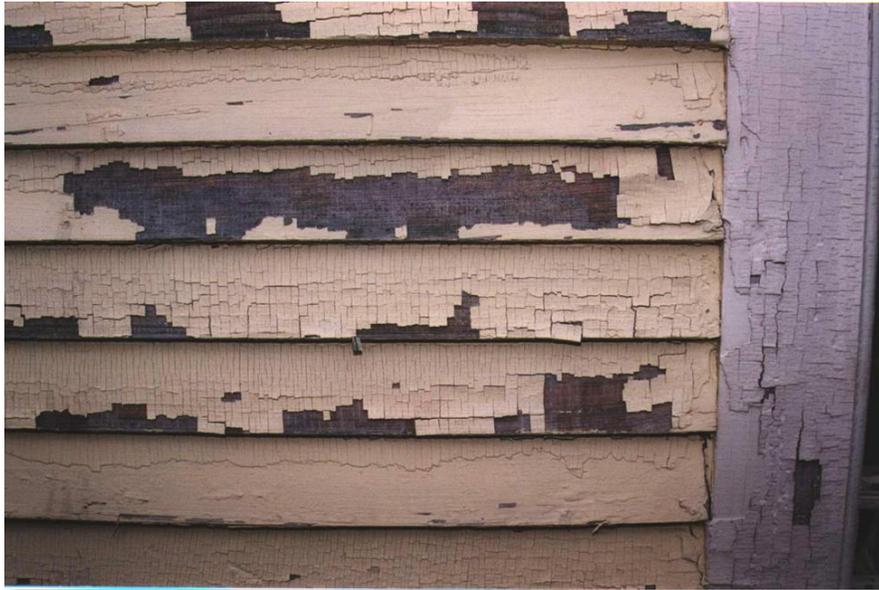


**981 children under
6 had a confirmed
elevated blood
lead level in Iowa
during 2019.**

**That's enough to fill
13.5 school buses.**

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

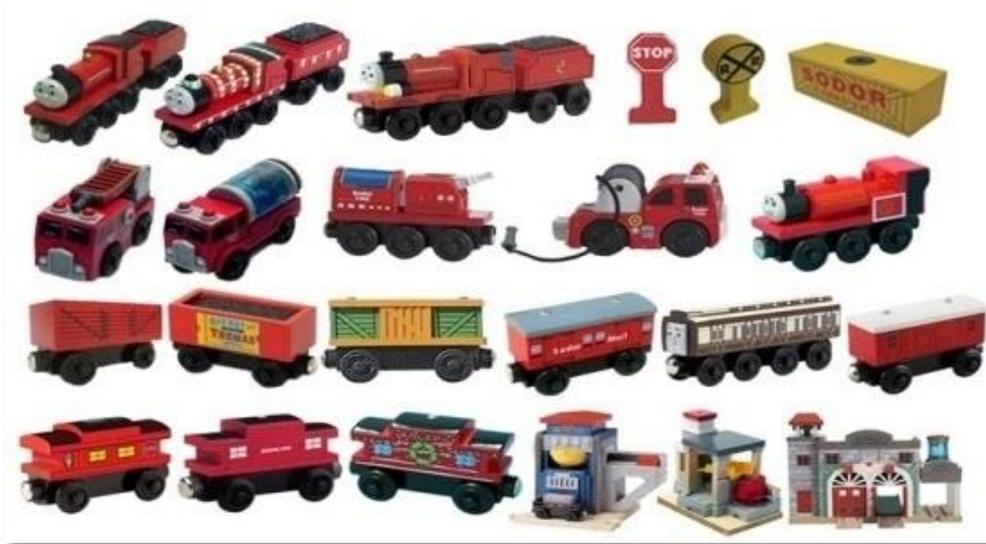
LEAD in the child's environment



Peeling, cracking, and chipping lead-based paint is a hazard, especially when it breaks down into an invisible dust.

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

LEAD in the child's environment



Children's Toys



Candy (Packaging)

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

LEAD in the child's environment



Jewelry



Pottery

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

**Social variables
that put some
children at risk for
lead poisoning**



Exposure to lead can seriously harm a child's health.



Damage to the brain and nervous system



Slowed growth and development



Learning and behavior problems



Hearing and speech problems

This can cause:



Lower IQ

Decreased ability to pay attention

Underperformance in school



Health effects of lead on children

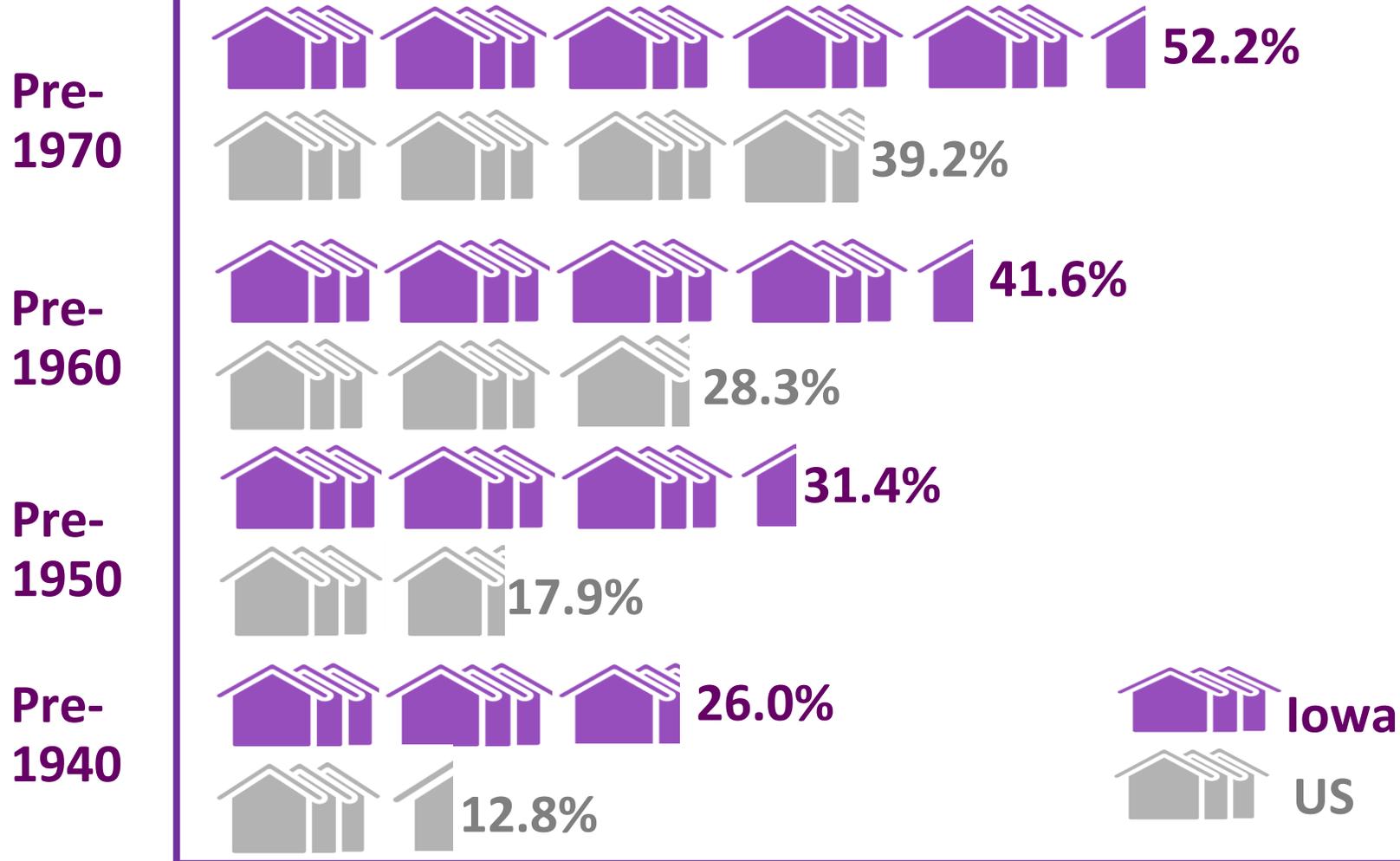
Mandatory Blood Lead Testing: A Matter of Health Equity for Children

Primary Source of Childhood Lead Exposure in Iowa – Pre-1978 Housing



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

US and Iowa Housing Data



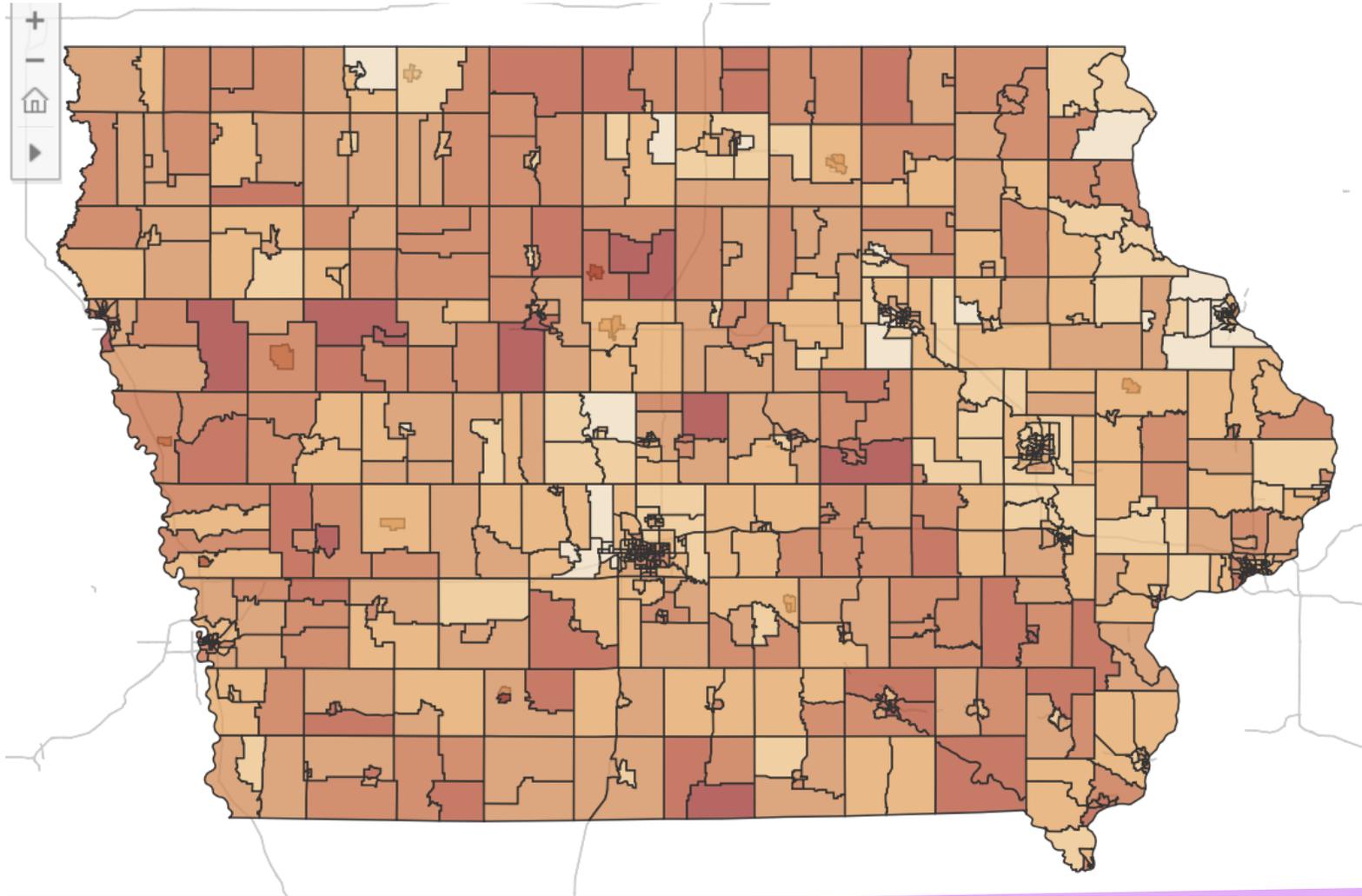
10

Iowa ranks top 10 nationally in age of Homes built before 1970

Source: US Census, ACS Data 2017

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Lead Risk Model by Census Tract



Source: Iowa Public Health Tracking Portal

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Overview: Mandatory Blood Lead Testing



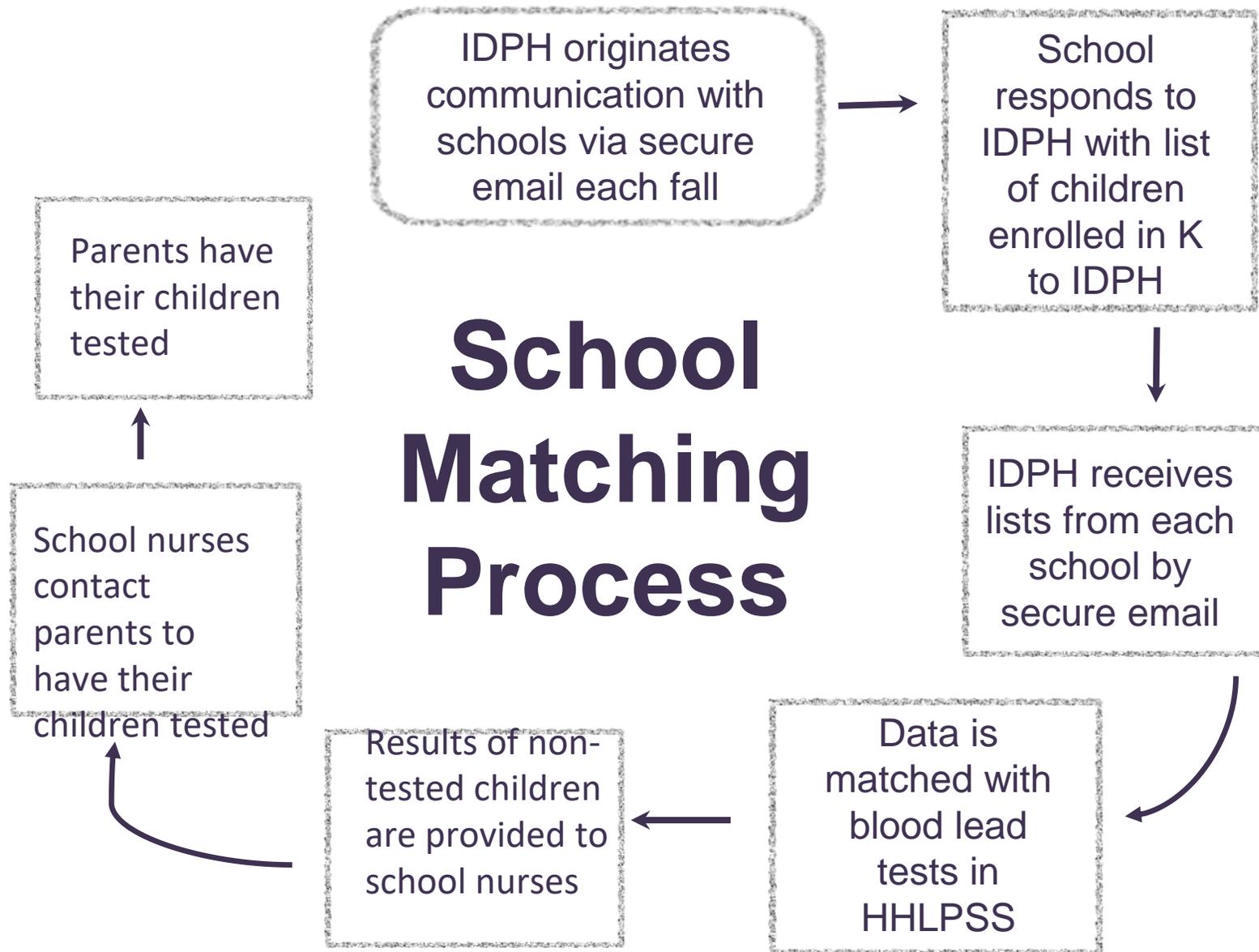
The bill passed 2007-08
legislative - IAC 641 Chapter 67

Requiring all Children entering
kindergarten to have evidence
of at least one blood lead test.

Children will NOT be kept out
of school

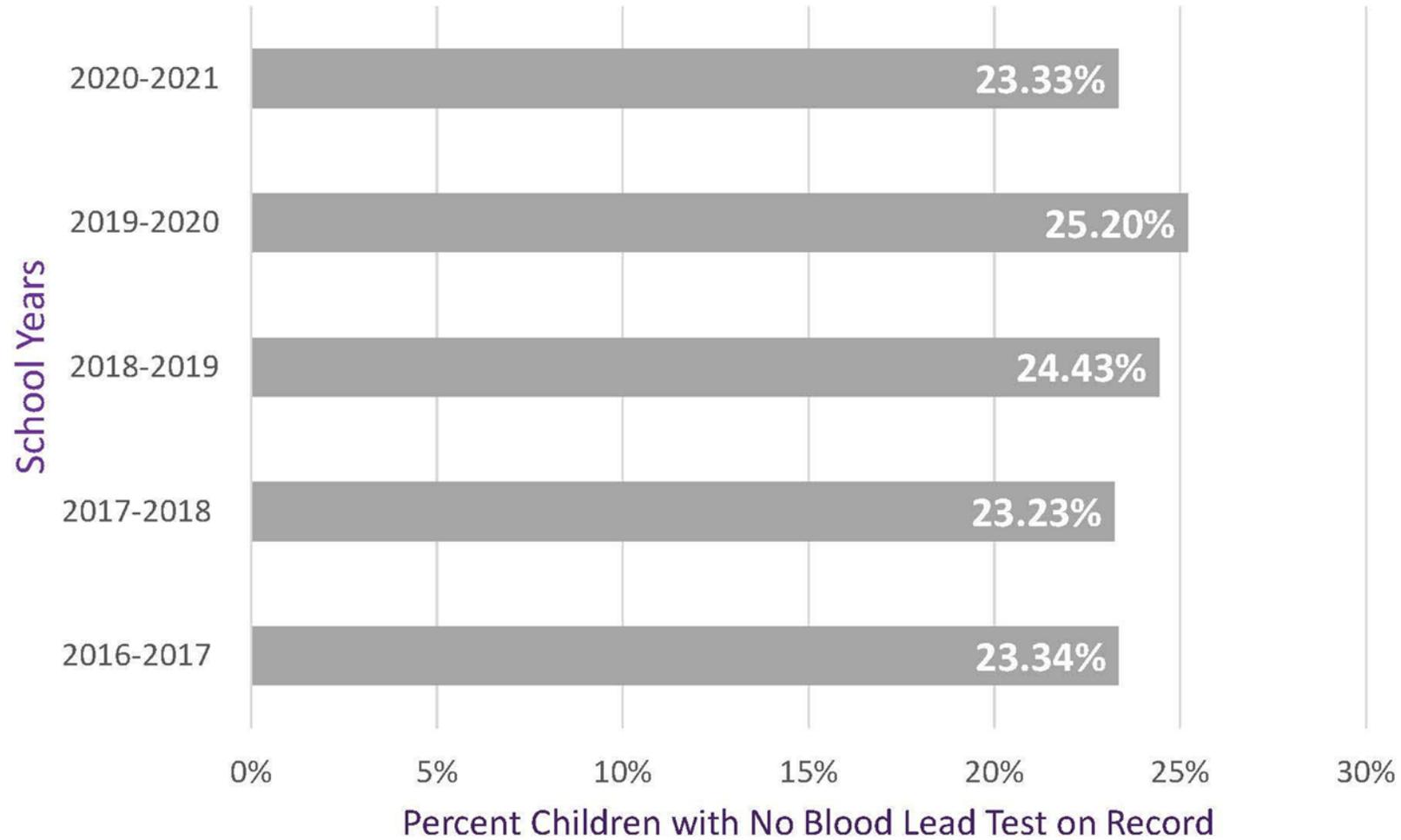
The purpose of the blood lead testing requirement is to improve the health of Iowa's children.

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children



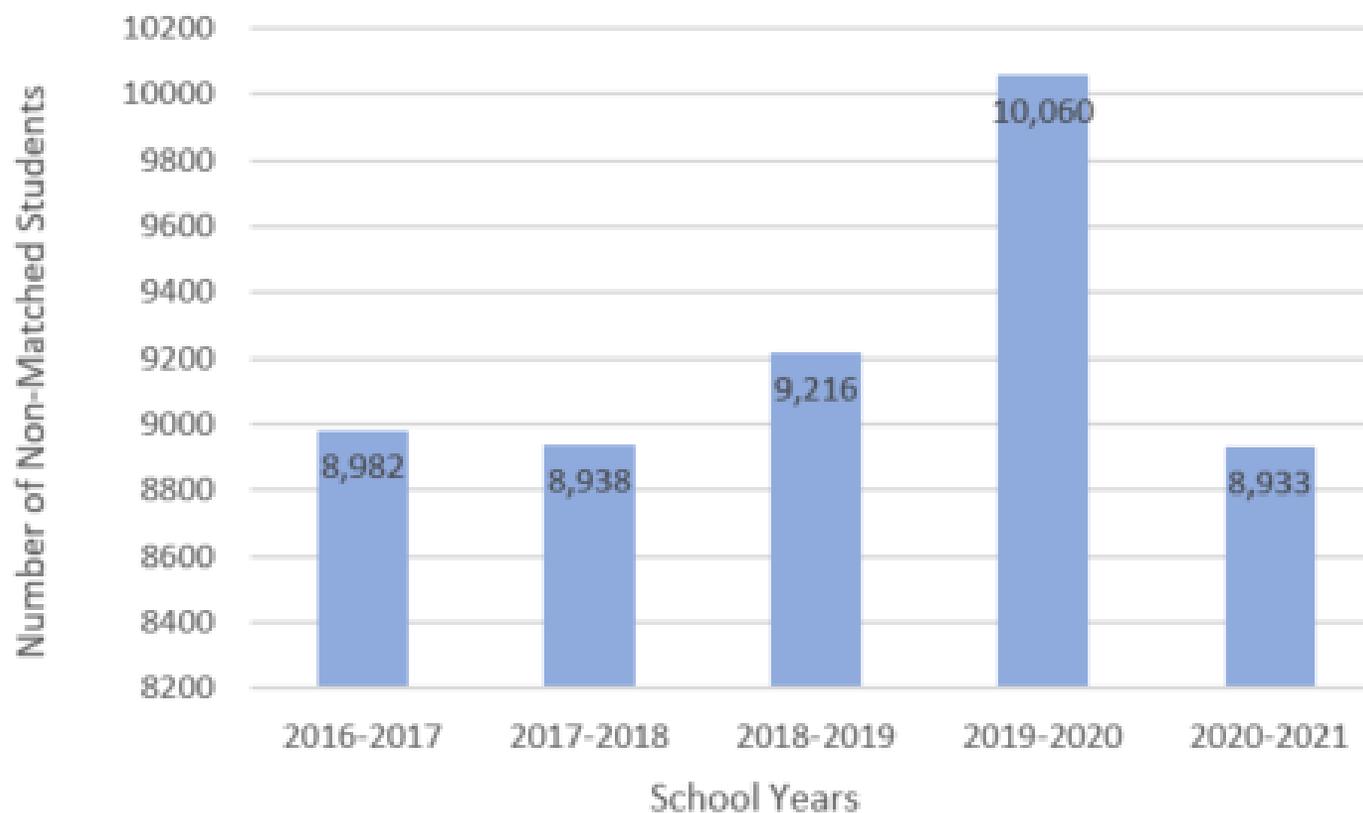
Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Percentage of Kindergarten Children with No Blood Lead Test On Record with IDPH - School Years 2016 through 2020



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Total Number of Non-Matched Students from School List - School Years 2016-2020



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

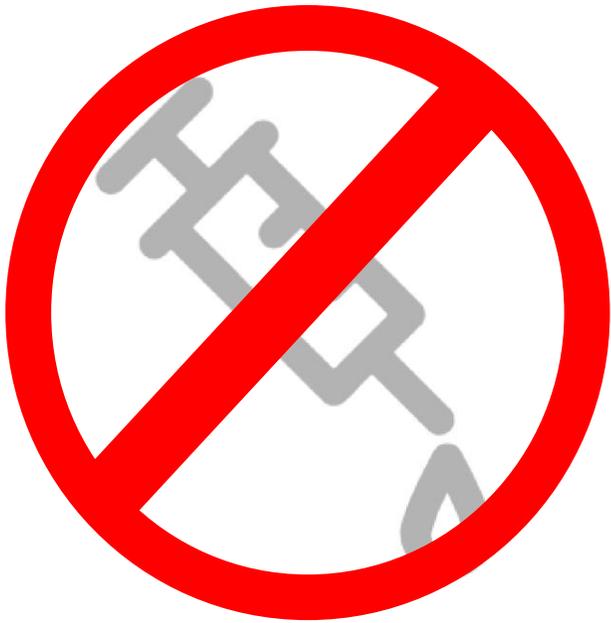
1 in 4

Children entering kindergarten
have no record of a blood lead test.



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Possible causes for a missing blood lead test



1. Children never had a test.
2. Children had a test outside Iowa.
3. They had a test in Iowa, but it was not reported to IDPH.
4. They had a test and it was reported to IDPH, but under a different name.
5. Misspelling errors
6. Religious or very low risk exemptions

Communication to parents about NO lead test

Memorandum to Inform Parents About Lead Results

The following memorandums can be used by school nurses to send to parents or guardians notifying them that their child may not have received a blood lead test according to records at the Iowa Department of Public Health.

English Version: [Memorandum to Parents \(English\)](#) 

Spanish Version: [Memorandum to Parents \(Spanish\)](#) 

Arabic Version: [Memorandum to Parents \(Arabic\)](#) 

French Version: [Memorandum to Parents \(French\)](#) 

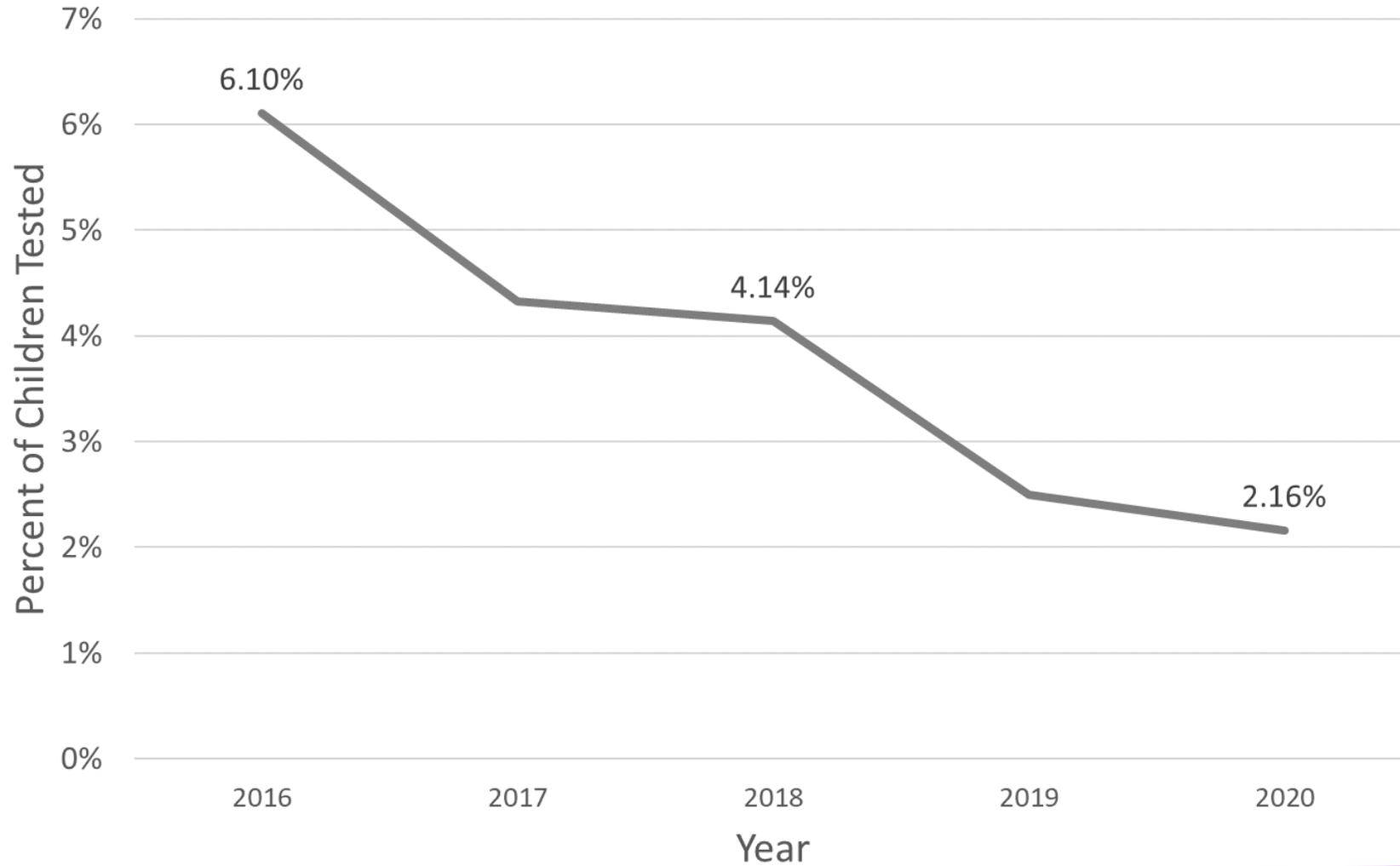
Laotian Version: [Memorandum to Parents \(Laotian\)](#) 

Swahili Version: [Memorandum to Parents \(Swahili\)](#) 

<https://idph.iowa.gov/Environmental-Health-Services/Childhood-Lead-Poisoning-Prevention/Providers-Labs-and-Schools/School-Lead-Screening>

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Percent of Children Tested After Notification is Sent to Parents: 2016 - 2020



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Research Question:

Which regions and counties have the highest percentage of kindergarten students without a blood Lead test?

What are the Measures and Trends to Explore?



Geographic Variation

County of residence &
statistical region



Elementary Schools

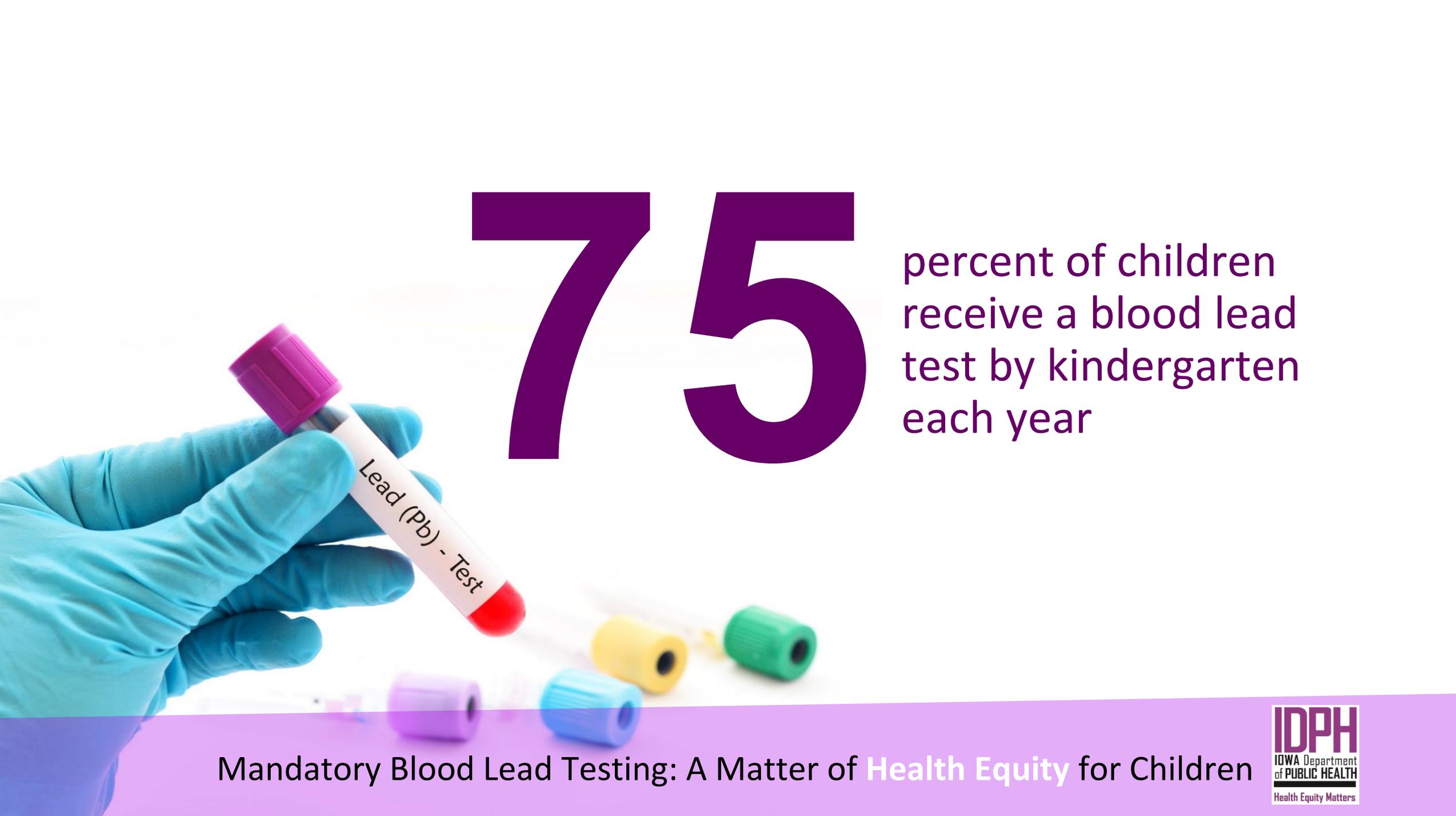
School districts & academic years
for kindergarten students



Unmatched Blood Lead Tests

Either the child did not receive a blood lead test or
there is not a record of a blood lead test

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

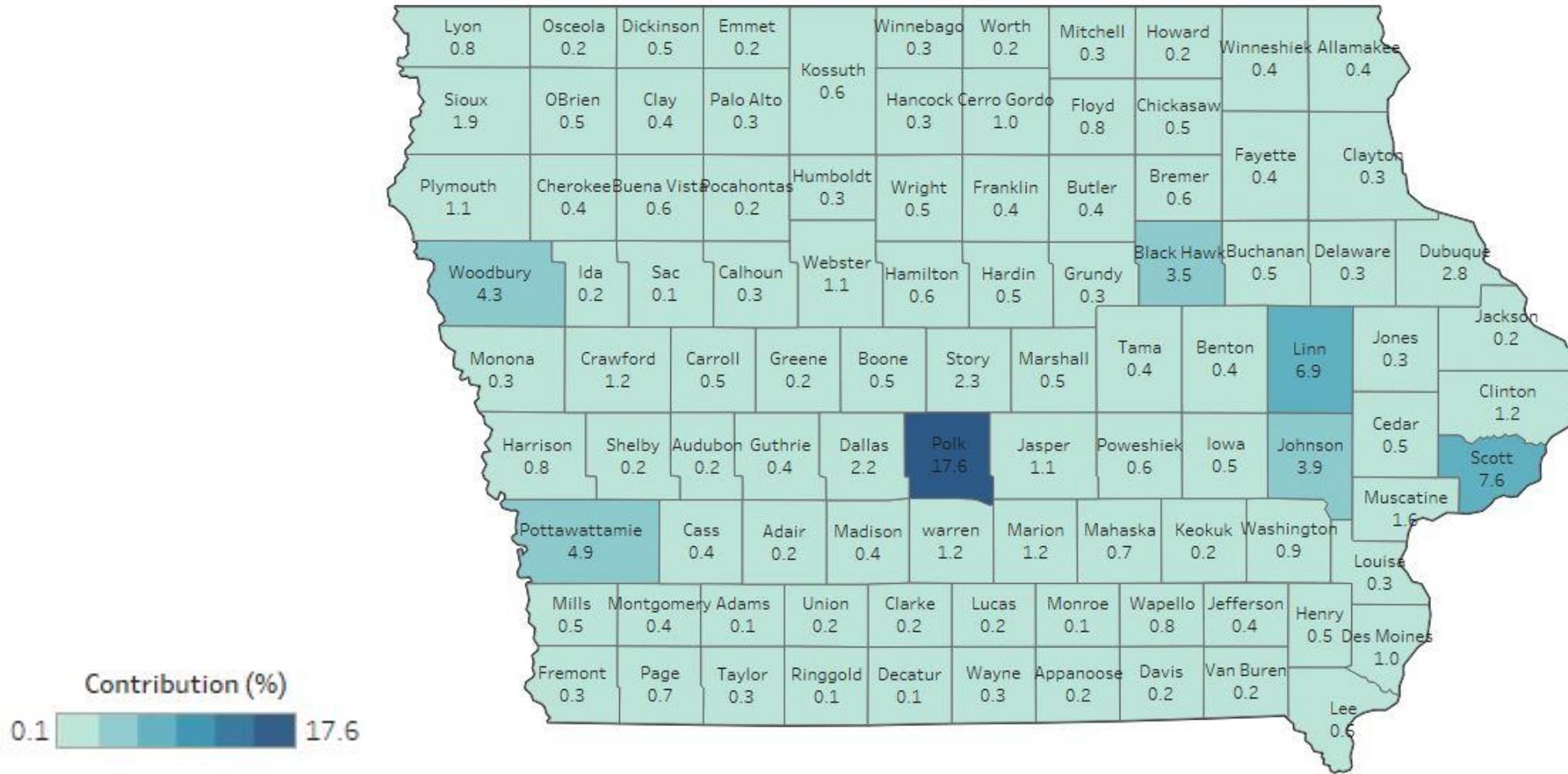


75

percent of children
receive a blood lead
test by kindergarten
each year

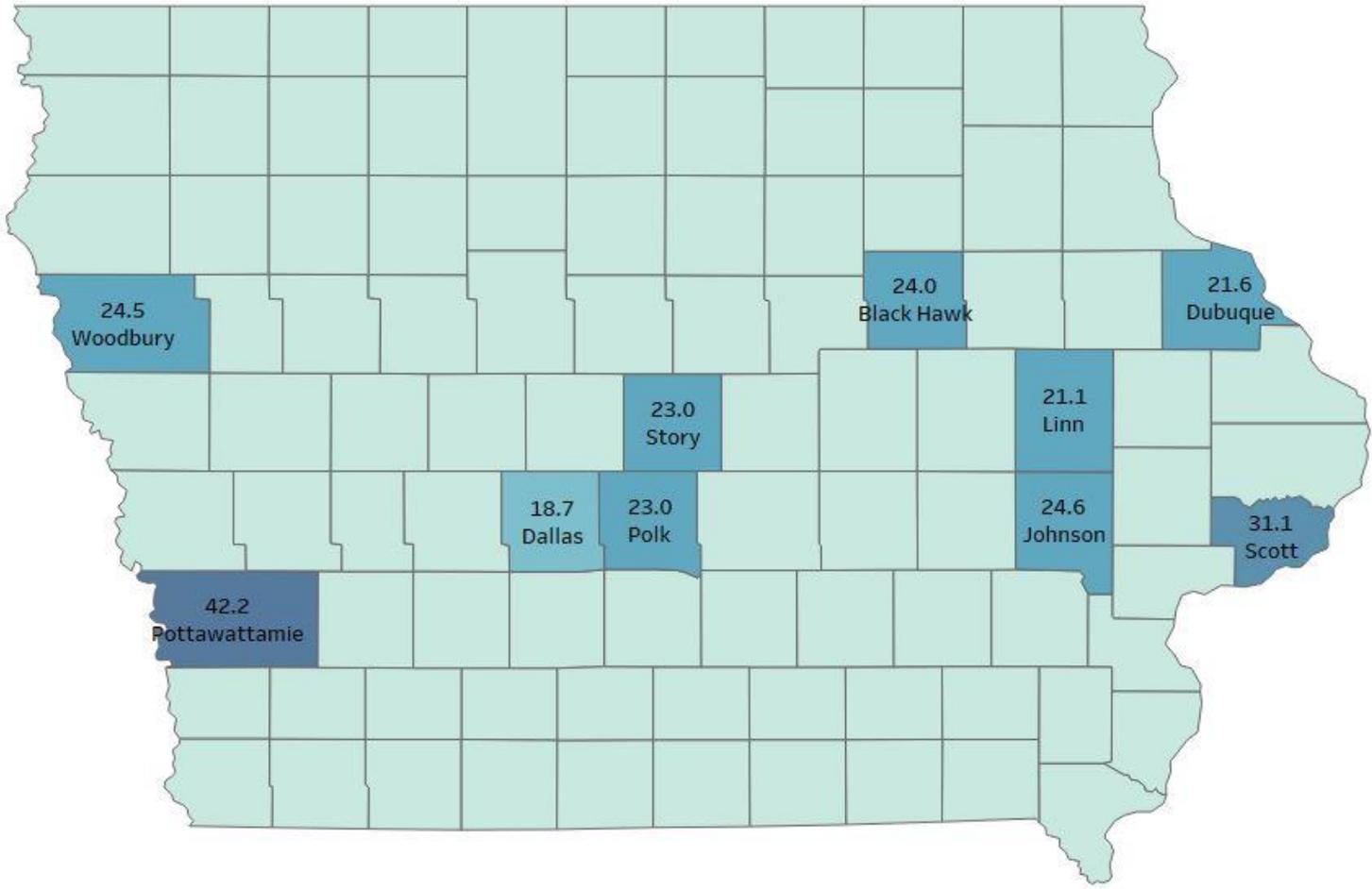
Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Kindergarten Students Who Did Not Have a Blood Lead Test – By County (2016-2020)



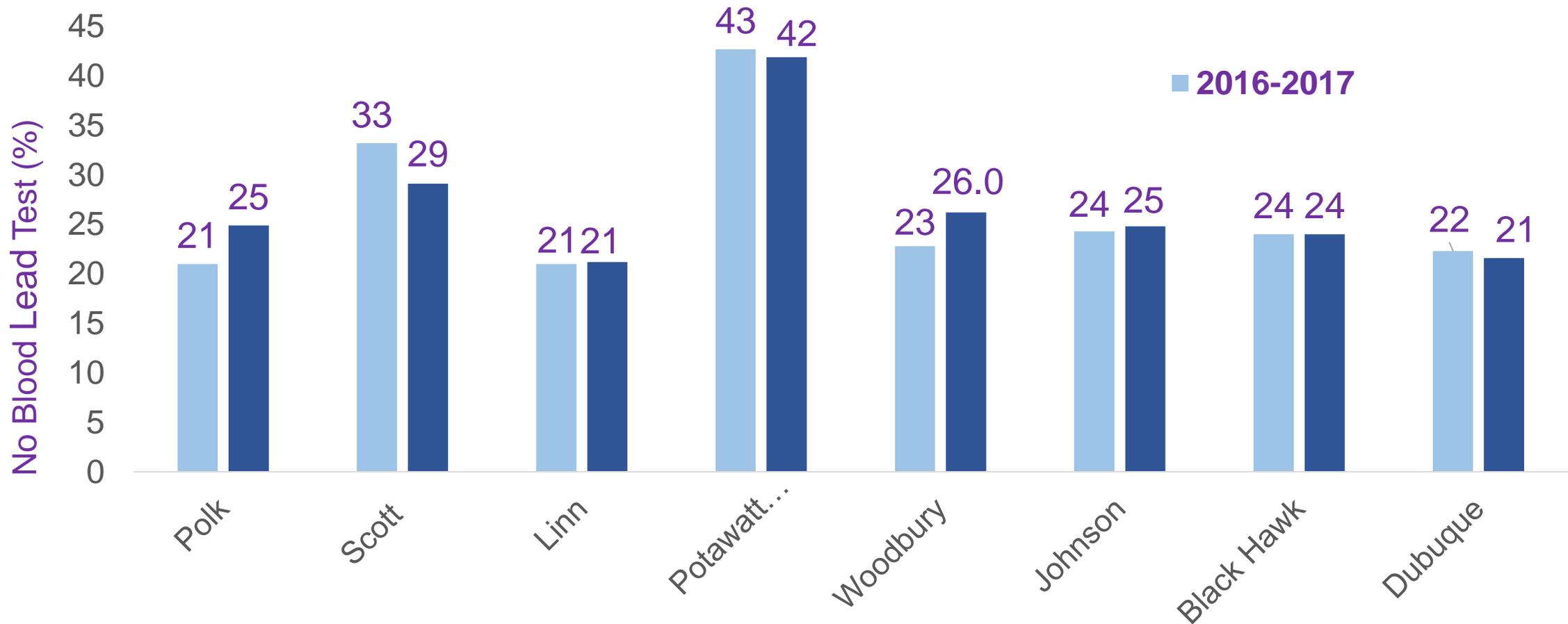
Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

What is the % of Kindergarteners without a Report of a Blood Lead Test by Metropolitan County of Residence?



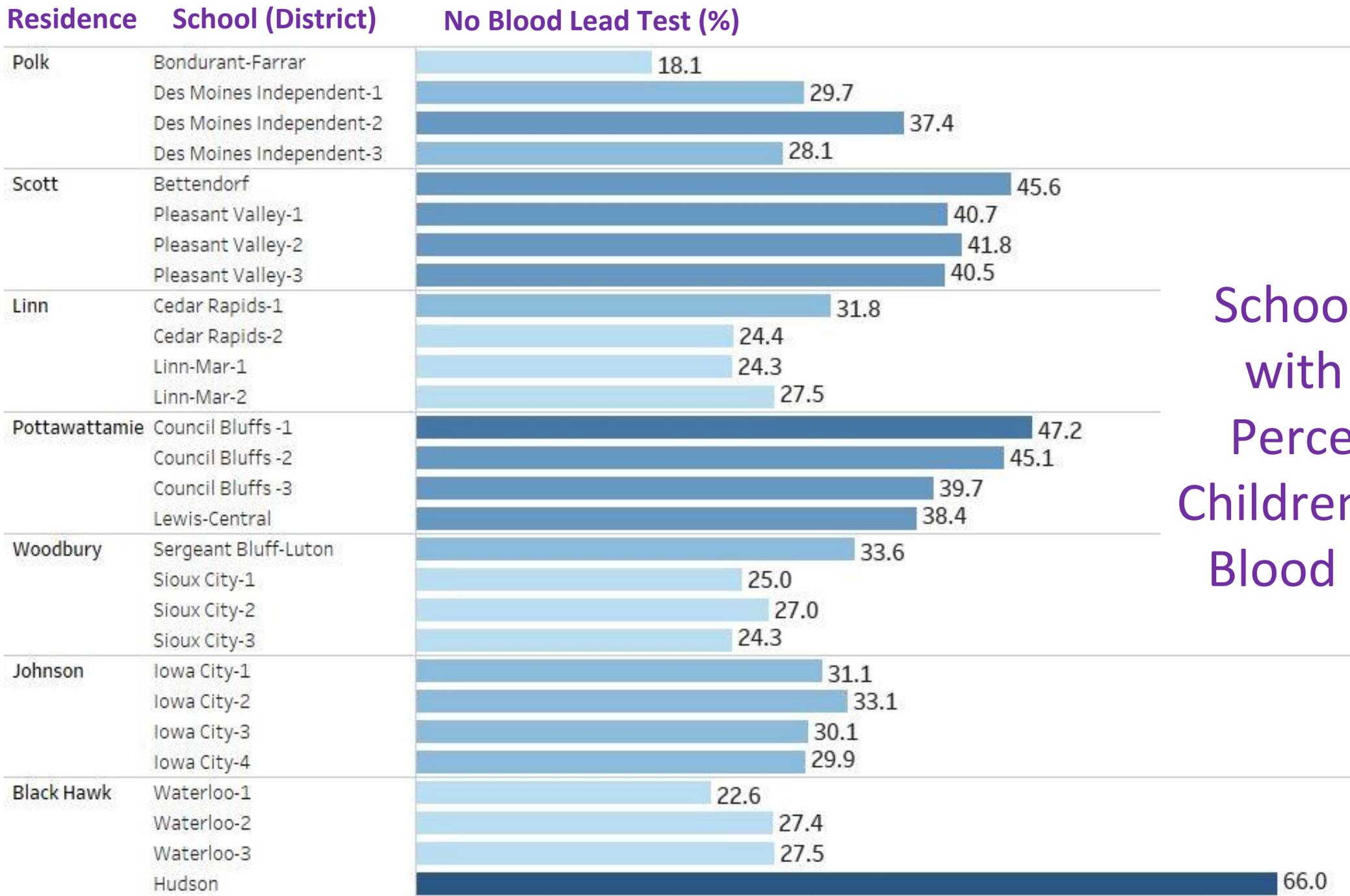
Top Contributing Metropolitan Counties of Residence without a Blood Lead Test

Percent of Children without a Blood Lead Test by Metro Counties of Residence and Academic Year



**Represents Top Contributing (>3%) Metropolitan Counties of Residence without a Blood Lead Test*

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children



School Districts
with Highest
Percentage of
Children without a
Blood Lead Test

Which Top Contributing Metropolitan Counties Have the Highest Odds for Kindergarteners Not Having a Blood Lead Test?



Compared to Kindergartners who reside in Polk County, children living in **Pottawattamie** were **60%** more likely to not have a blood lead test.

Compared to Kindergartners who reside in Polk County, children living in **Scott** were **35%** more likely to not have a blood lead test.

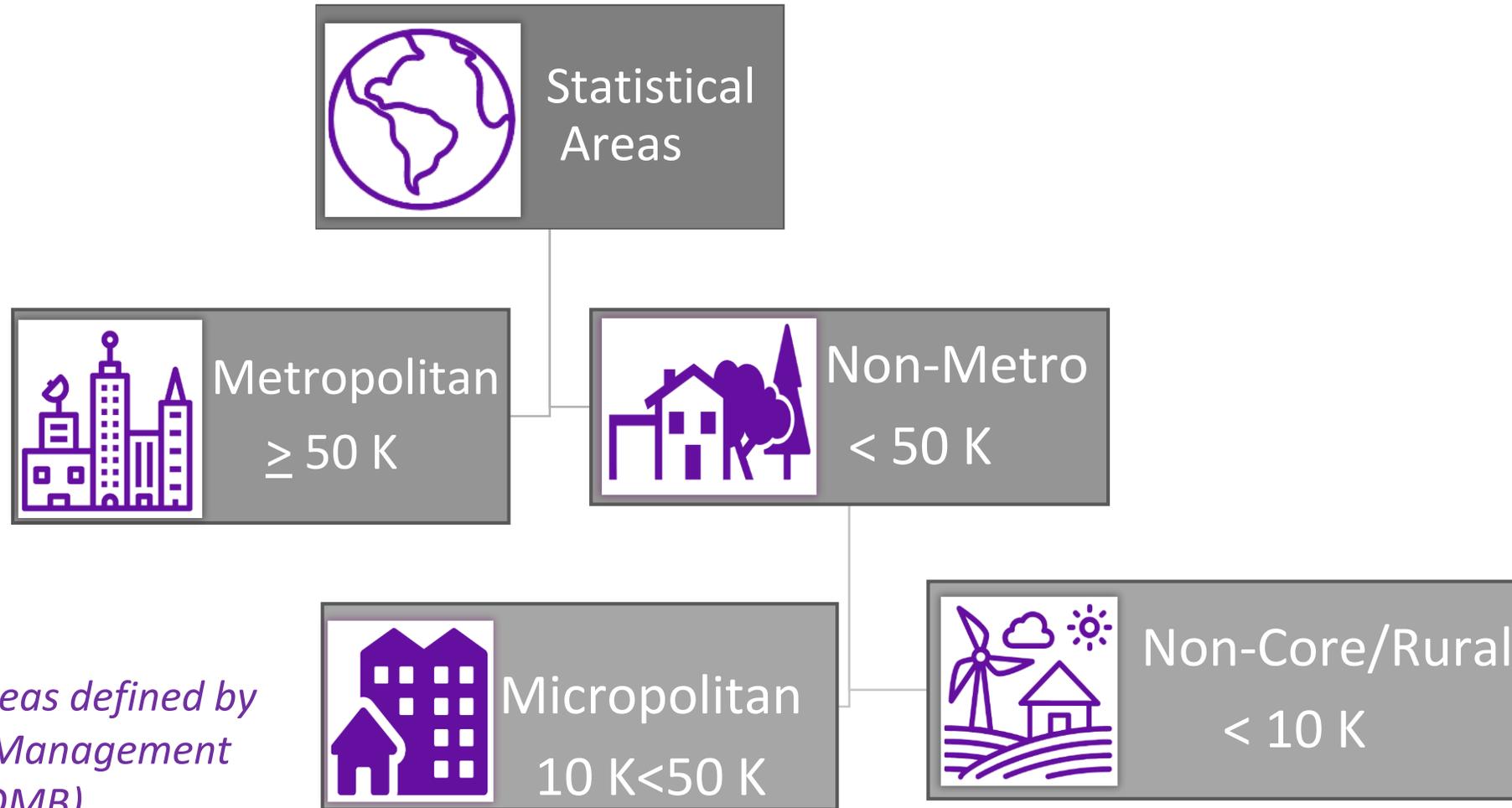


How Do These Findings Compare to Non-Metro Areas?



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

The Definitions for Statistical Areas*



**Statistical Areas defined by
The Office of Management
and Budget (OMB)*

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Where Do Children Reside Who Did Not Have a Blood Lead Test?



63.7%

reside in Metro (> 50 K)



24%

reside in Rural (< 10 K)

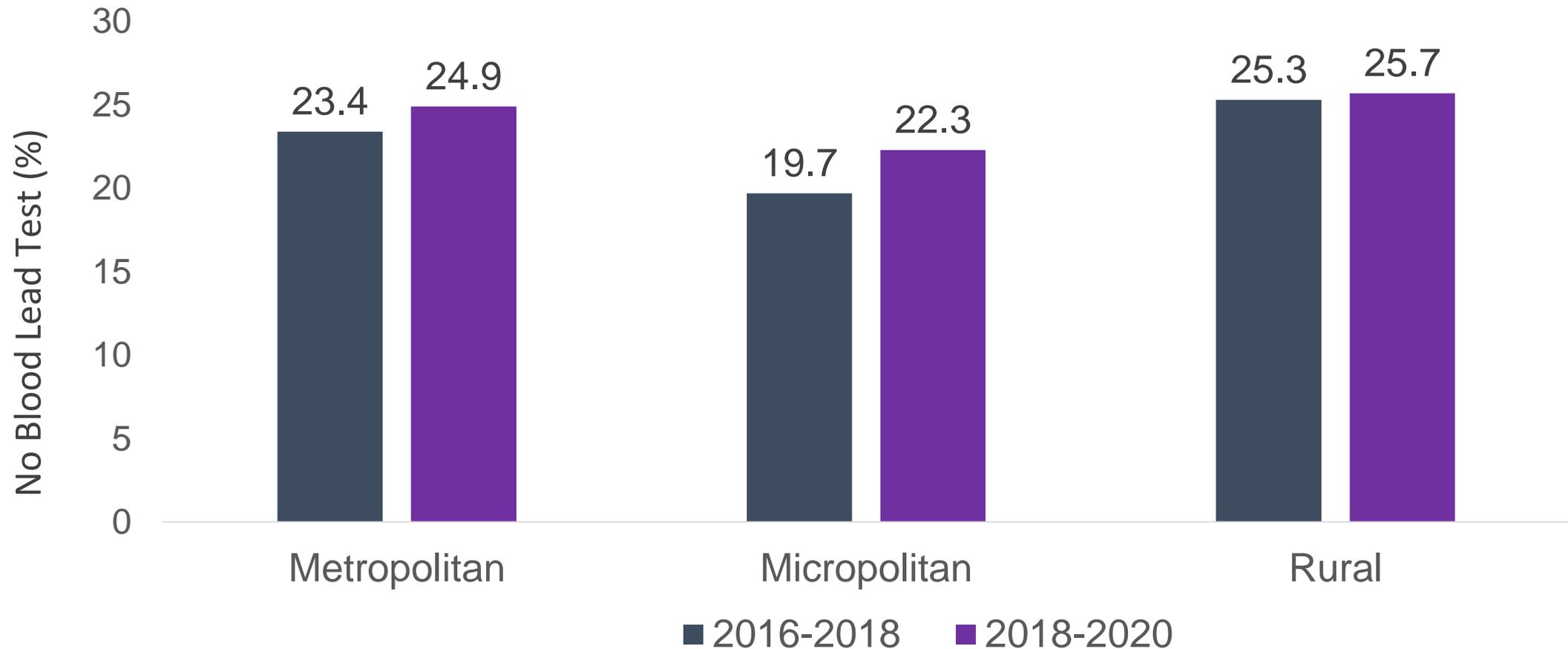


12.3%

reside in Micropolitan (10K<50K)

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Percent of Children without a Blood Lead Test by Statistical Region of Residence (2016-2020)



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Which Statistical Region had the Highest Odds of Not Having a Lead Test?

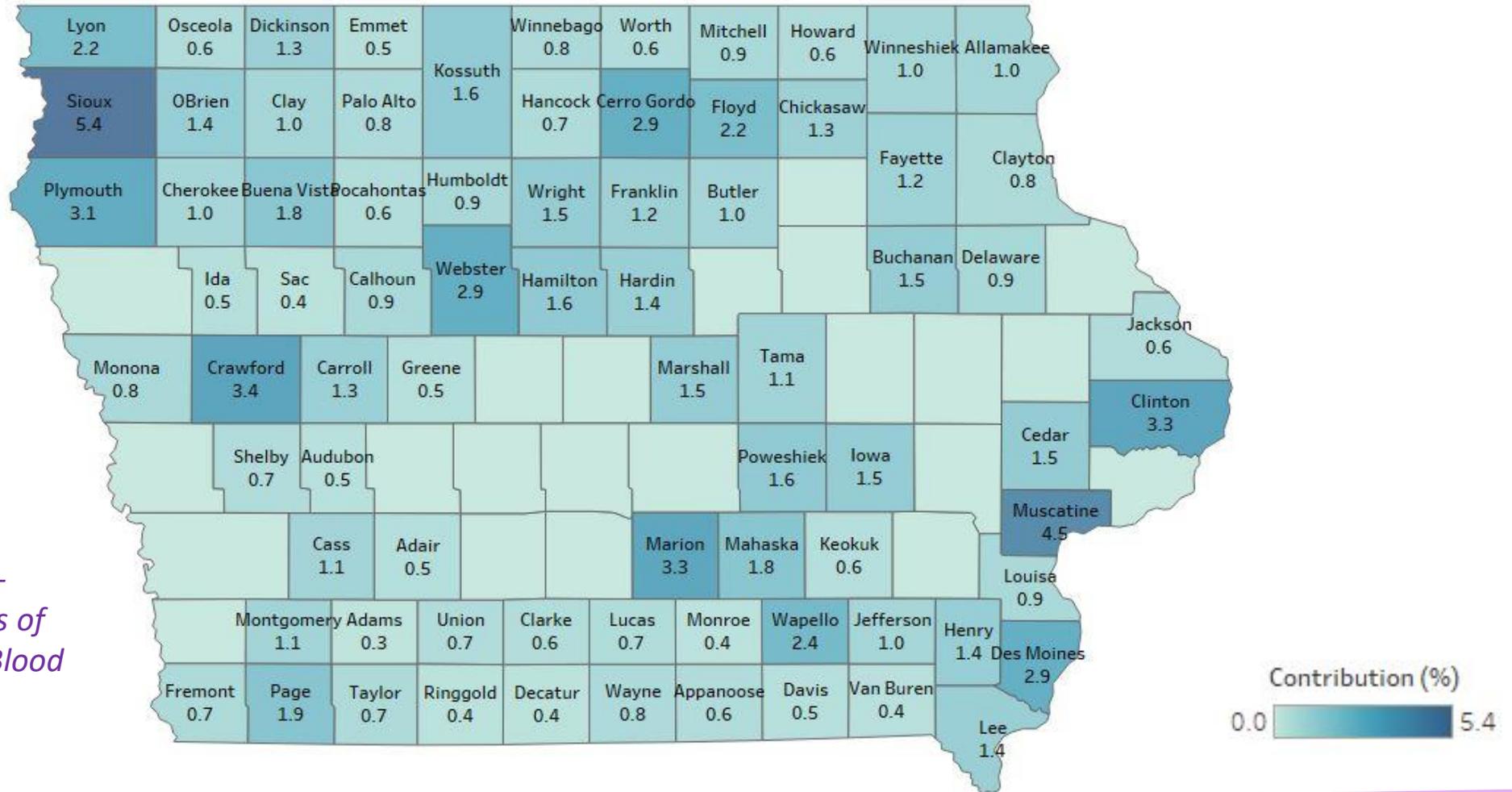


Children who resided in **Rural** areas had the highest likelihood to not have a record of a blood lead test when compared to Metropolitan and Micropolitan regions.

When compared to rural areas, children who resided in **Micropolitan** areas were ~**30%** more likely to have a record of a blood lead test.



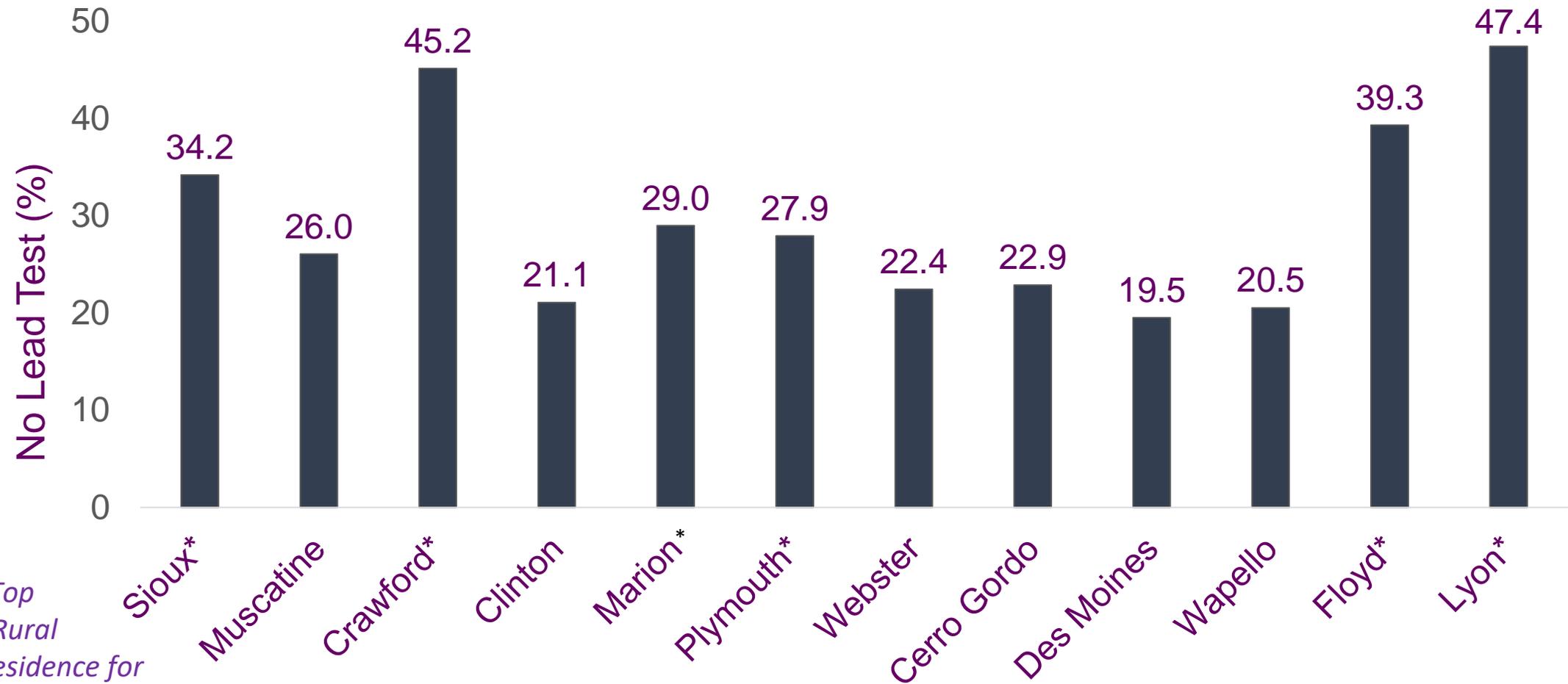
The Non-Metro County Contribution of Kindergarten Students Who Did Not Have a Blood Lead Test (2016-2020)



Top Contributing Non-Metropolitan Counties of Residence without a Blood Lead Test

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

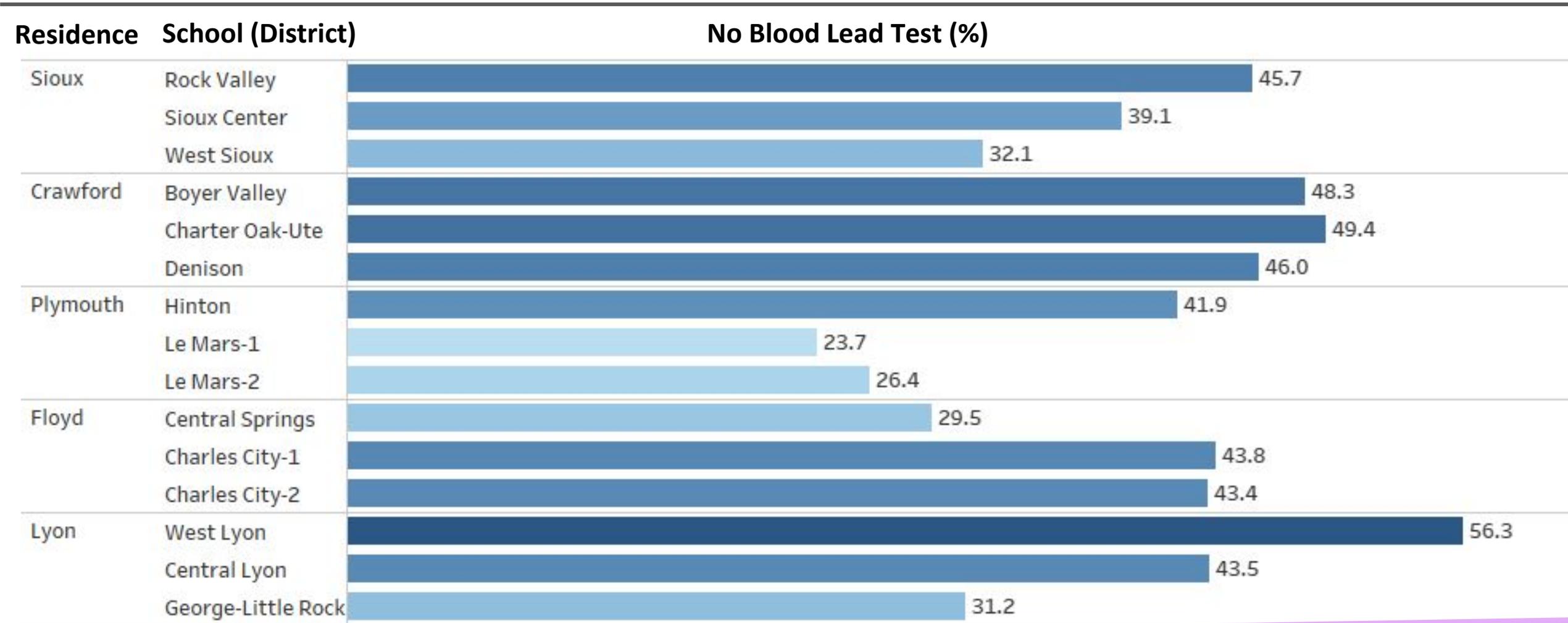
Percent of Children without a Blood Lead Test for Non-Metro Counties of Residence*



*Represents Top Contributing Rural Counties of Residence for Kindergarten Students without a Lead Test

Mandatory Blood Lead Testing: A Matter of Health Equity for Children

Percent of Kindergartners Who Do Not Have a Lead Test by County of Residence and School Attended



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Conclusions

1. Kindergarteners who resided in rural counties had the highest likelihood to not have a blood lead test, followed by Metropolitan, and Micropolitan areas of residence.
2. More than six out of ten kindergartners with no lead test resided in Metropolitan areas.
3. Kindergarteners who resided in the Metro counties of Pottawattamie (42%) and Scott (31%) had the highest number of children without a blood Lead test.

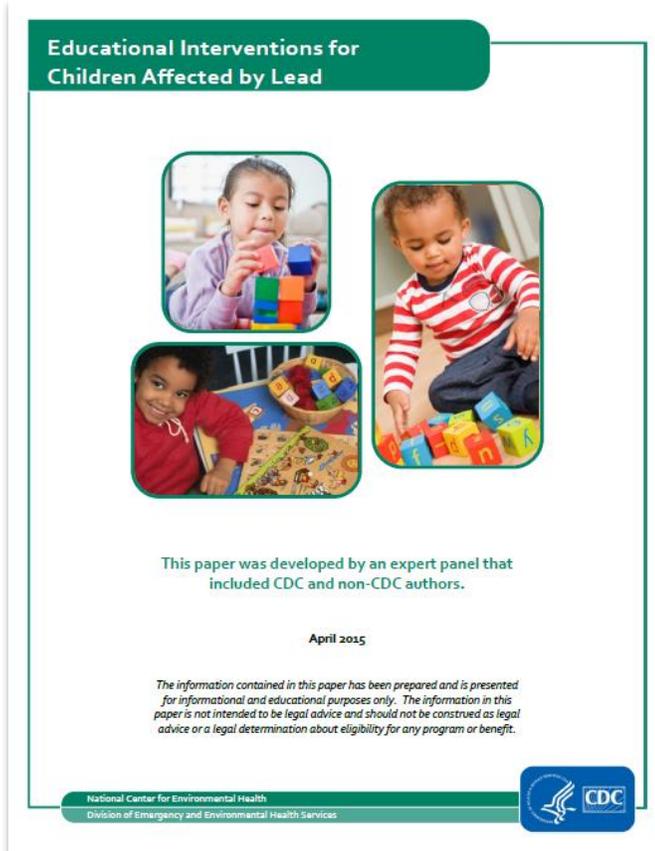
Conclusions

4. For Metro areas, schools in the Bettendorf, Pleasant Valley, and Council Bluffs school districts had some of the highest percentages of kindergartners without an evidence of a blood lead test (> 45%).
5. The rural counties Sioux (35%) and Crawford (45%) were not only the top contributing but also had the highest percentage without a blood lead test.
6. Race and ethnicity variables are needed to better understand which populations are at increased risk to not have a blood lead test.

Childhood Lead Poisoning Prevention Program and Health Equity

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Consequences of Lead on Learning and Educational Attainment

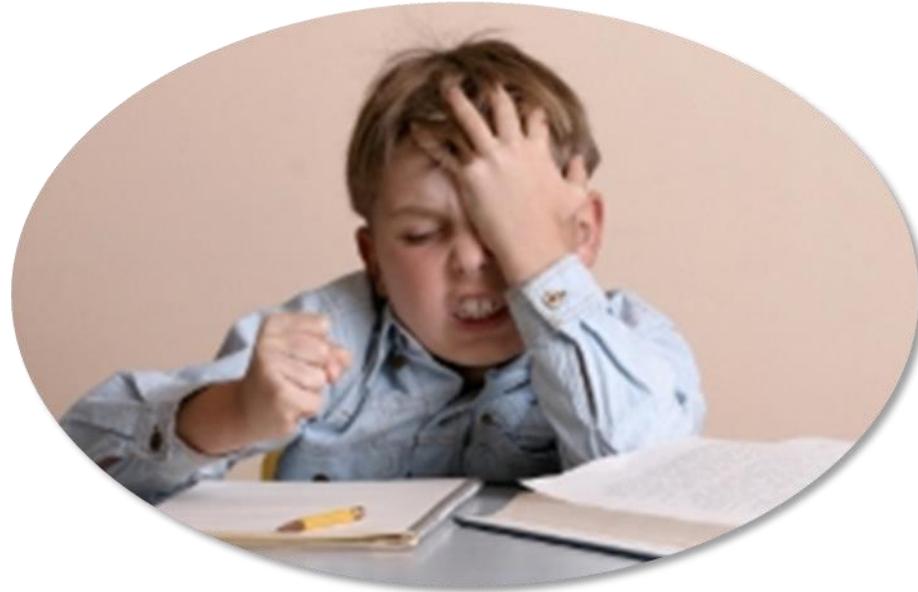


www.cdc.gov

1. Strong relationship between slightly HBLLs in young children and decreased scores on end-of-grade tests in elementary school (Wheeler and Brown, 2013)
1. For BLLs only 1–2 $\mu\text{g}/\text{dL}$ above the 2009–2010 geometric mean BLL of 1.3 $\mu\text{g}/\text{dL}$ for U.S. children aged 1–5 years old
1. Studies show a consistent link between low-level lead exposure and the reduced ability of children to do well in school
1. Suggest that lead exposure is responsible for a significant and modifiable effect on the achievement gap
1. They also document that there are substantial costs to local communities to provide services to children.

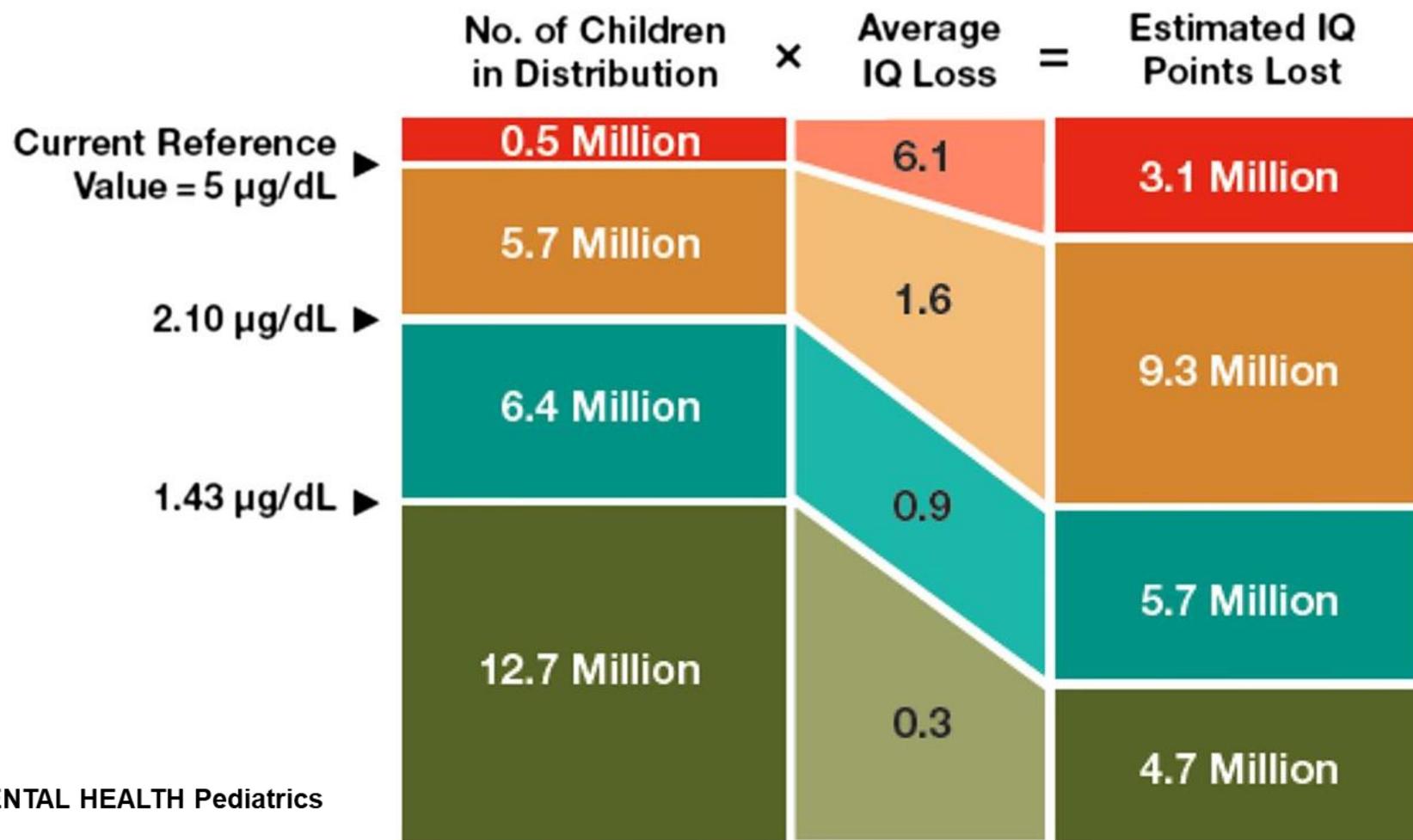
Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

For children, even low level exposures to lead have been shown to affect **IQ**, ability to pay attention, **impulse control**, behavior and **academic achievement**.



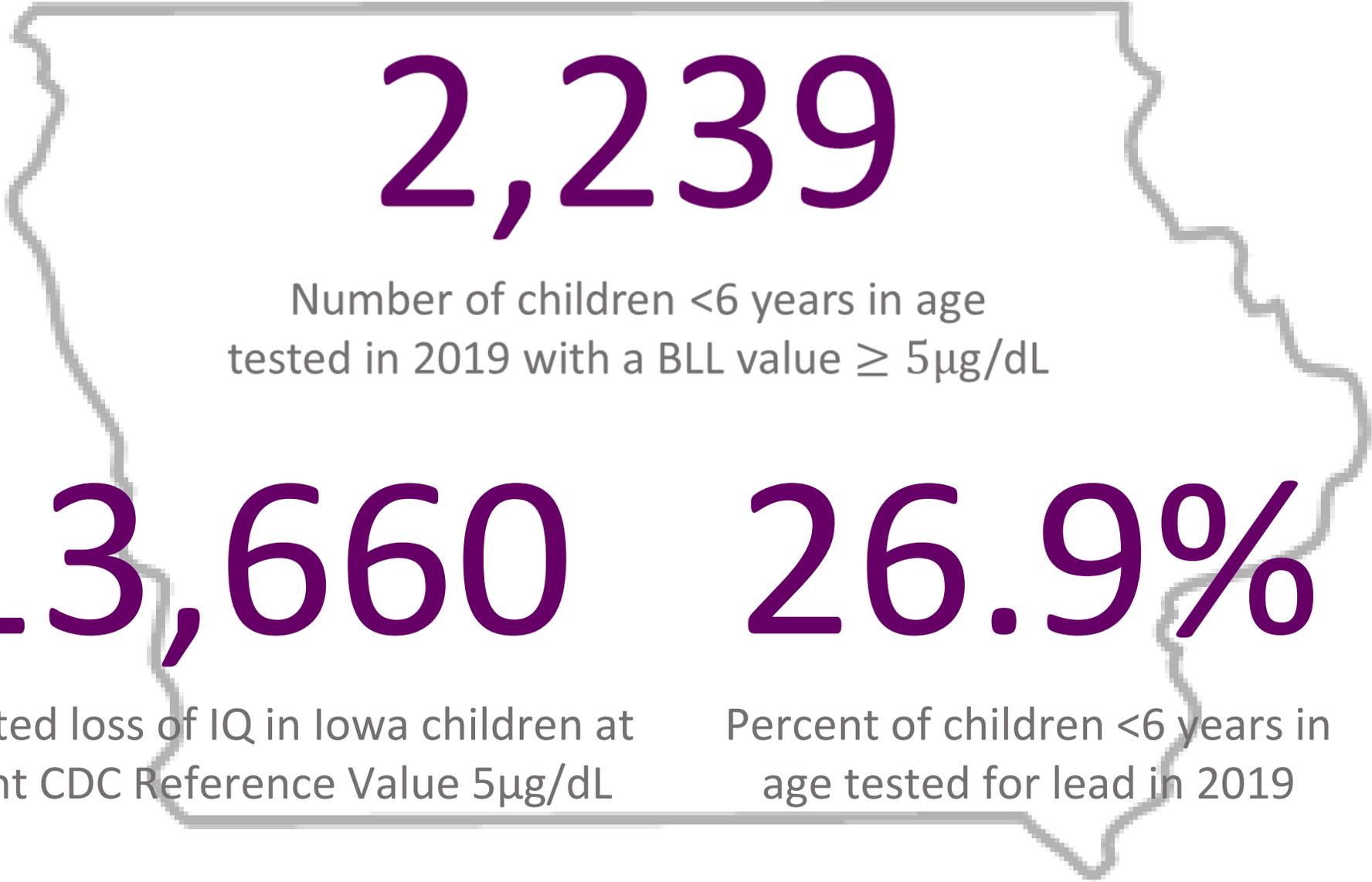
Impacts often do not become evident until **years after** the lead **exposure** occurred.

Estimated Loss of IQ in US Children at Different Intervals of Blood Lead ($\mu\text{g}/\text{dL}$)



COUNCIL ON ENVIRONMENTAL HEALTH Pediatrics
2016;138:e20161493

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children



2,239

Number of children <6 years in age tested in 2019 with a BLL value $\geq 5\mu\text{g}/\text{dL}$

13,660

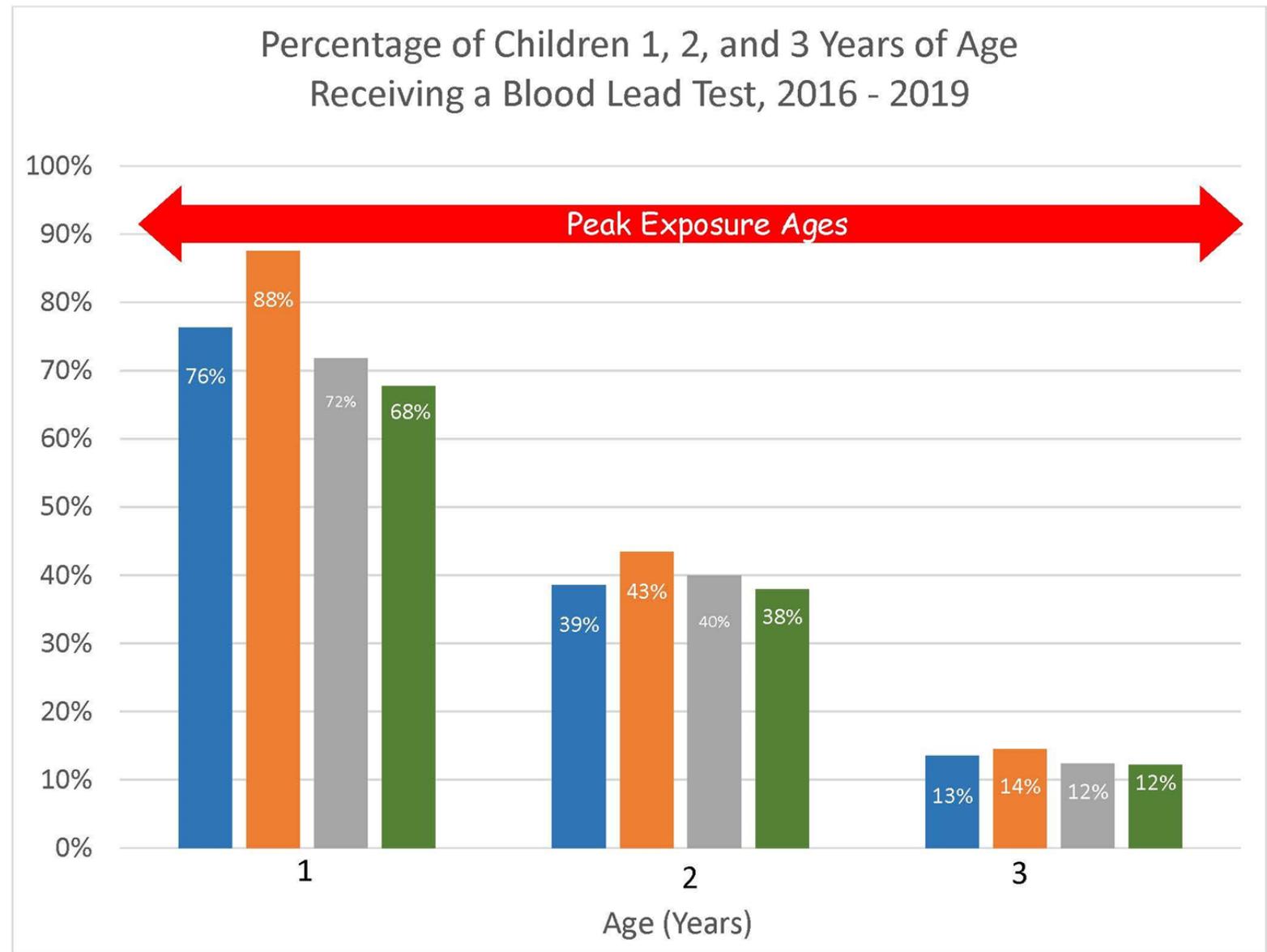
Estimated loss of IQ in Iowa children at current CDC Reference Value $5\mu\text{g}/\text{dL}$

26.9%

Percent of children <6 years in age tested for lead in 2019

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

AAP: “Blood lead concentrations of children who live in lead contaminated environments typically increase rapidly between 6 and 12 months of age, **peak between 18 and 36 months of age**, and then gradually decrease.”



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

If you don't test,
you don't diagnose.

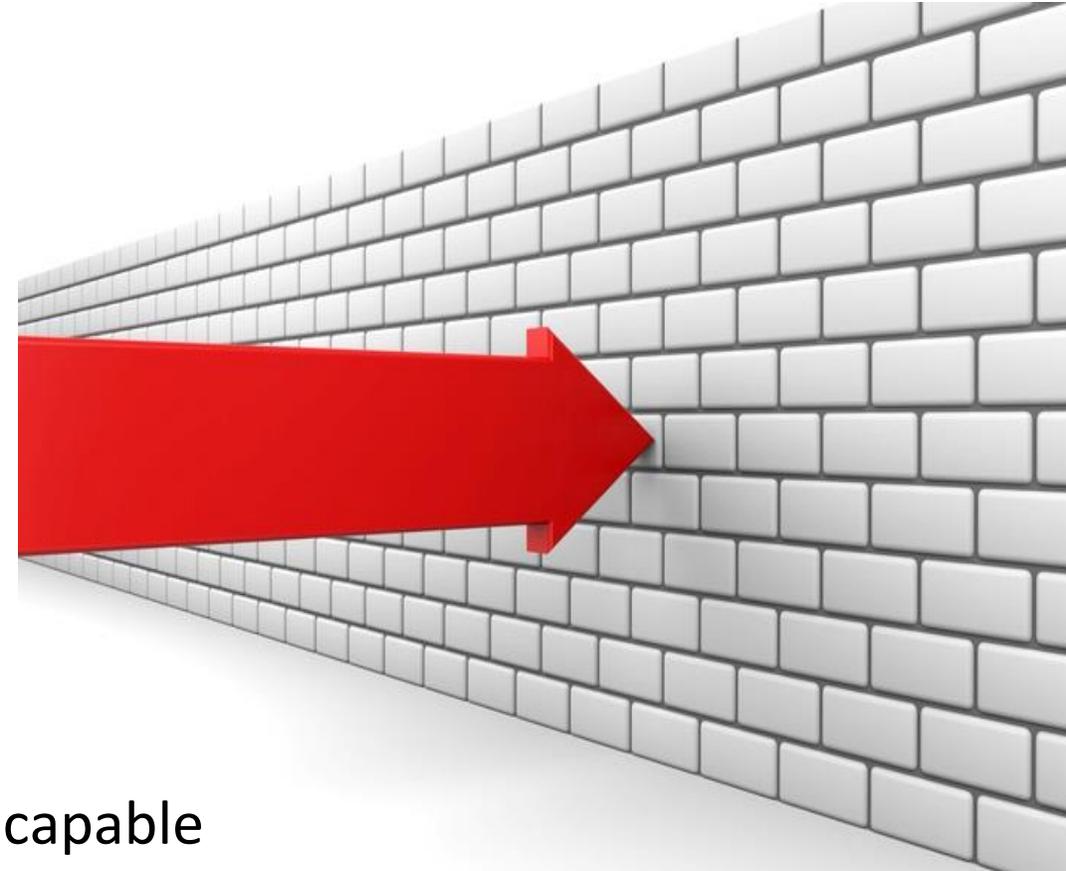


If you don't diagnose,
you can't intervene.

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

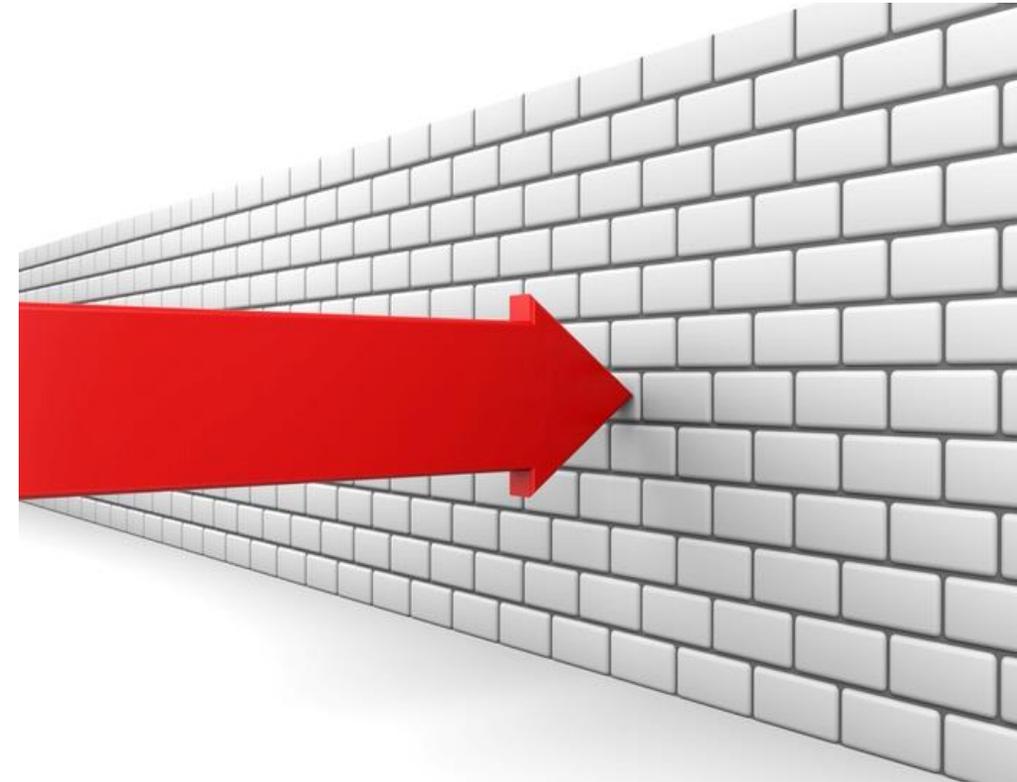
2019 Survey Identified Primary Obstacles to Testing

- Survey of clinical testing practices on children 1 & 2 year in age
 - Surveyed:
 - 7- large medical network clinics
 - 6- small rural clinics
 - Key survey questions:
 1. What blood lead testing guidelines are being followed?
 1. What are the barriers to testing?
 2. Does clinic/provider have EMR system capable of sending reminders?

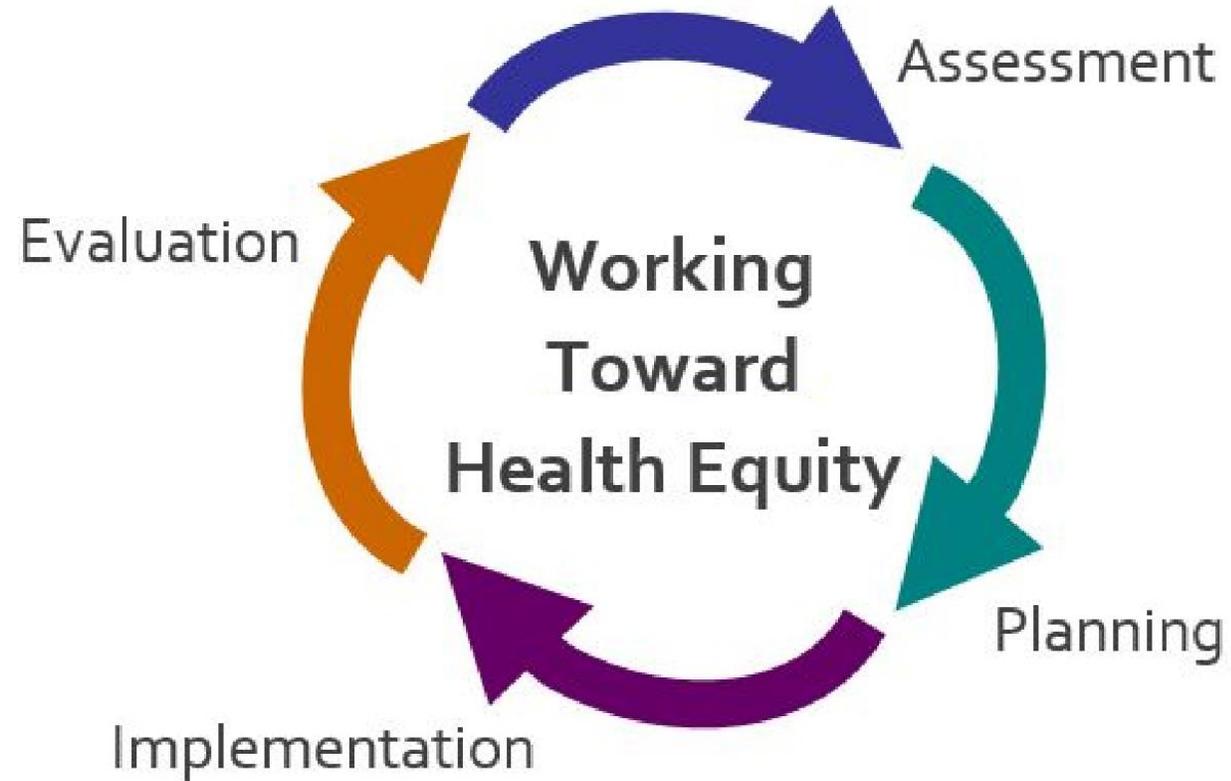


2019 Survey Identified Primary Obstacles to Testing - Responses

1. Parental compliance with follow through of lab orders
2. No POC system on-site for testing
3. No further testing required if initial BLL low & no change in environment (providers/parents)
4. At least three to four different BLL test guidelines followed by providers (AAP/PEHSU, CDC, IDPH, Medicaid)
5. HEDIS Measure – managed care, not health care

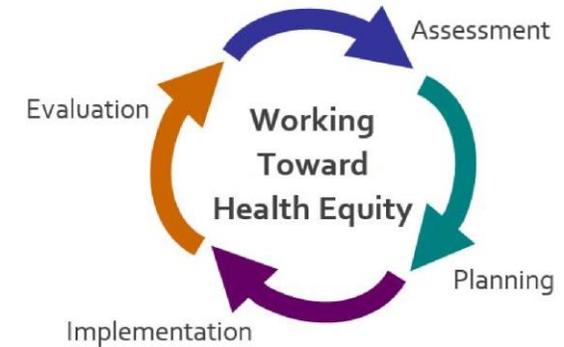


Blood Lead Testing & Health Equity



Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Blood Lead Testing & Health Equity – Childhood Lead Program



Assessment

- Using data to identify disparities
- Identify WHY and HOW

Planning

- Applying Health Equity Lens
- Collaboration & Engagement
- Policy, Systems, Environmental Change
- Health Equity Impact Assessment

Implementation

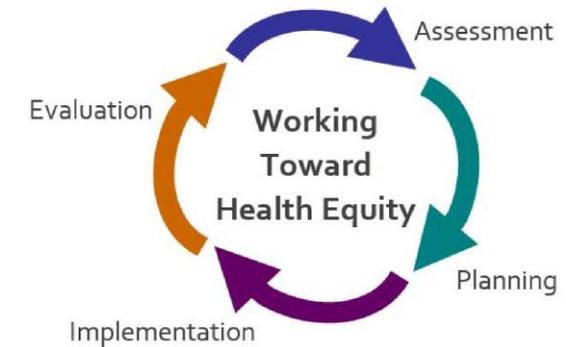
- Communication (Effective/Inclusive)
- Community engagement
- Performance Management

Evaluation

- Assess impact & effectiveness
- Share findings
- Ongoing QI

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Blood Lead Testing & Health Equity – Childhood Lead Program

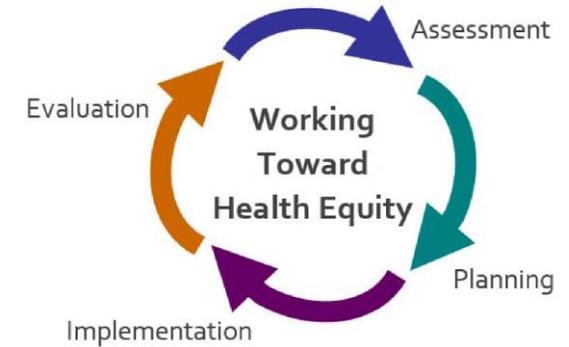


Working Towards Health Equity:

- MCEH CoIIN – Blood Lead Testing
 - ✓ Title V: SPM2 – Blood Lead Testing 1 & 2 year olds
 - ✓ Family Engagement & Partnership
- Effective & Inclusive Communication and Training
 - ✓ Partnership with Hispanic/Latino Communications Network
 - ✓ Social media, radio (PSA/blogs), print materials (news/magazines), web content
 - ✓ Professional training & certification opportunities

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Blood Lead Testing & Health Equity – Childhood Lead Program



Working Towards Health Equity:

- Childhood Lead Advisory Workgroup (CLAW)
 - ✓ Blood Lead Testing Subgroup
 - ✓ Lead & Housing Subgroup
- Health Disparities Data
 - ✓ Race, ethnicity, and socioeconomic status
 - ✓ Data sharing agreements
 - Vital records, DHS, HUD

Mandatory Blood Lead Testing: A Matter of **Health Equity** for Children

Sources

- IAC 641—Chapter 67 “Mandatory Blood Lead Testing”
- IAC 641—1.6(1)(a) (135,139A) “Report Blood Lead Test Results”.
- Healthy Homes Lead Poisoning Surveillance System (HHPSS), Iowa Department of Public Health (IDPH).
- IDPH Tracking Portal
- Department of Education.
<https://educateiowa.gov/documents/directories/2019/09/2019-2020-iowa-public-school-district-directory>
- Childhood Lead Poisoning Prevention Program
<http://idph.iowa.gov/Environmental-Health-Services/Childhood-Lead-Poisoning-Prevention>
- CDC Childhood Lead Poisoning Prevention Program: www.cdc.gov/lead